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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,459	07/22/2003	Shuichi Mizuno	3831.03	2554

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EXAMINER	
NAFF, DAVID M	

ART UNIT	PAPER NUMBER
1651	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/626,459	MIZUNO ET AL.	
	Examiner	Art Unit	
	David M. Naff	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/5/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-9,12-17,19 and 21-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-9,12-17,19 and 21-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/2/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

An amendment of 7/5/06 in response to an office action of 3/29/06 canceled claims 1-3, 10, 11, 18 and 20, amended claims 4, 6-8, 12, 19 and 21, and added new claims 23-28.

Claims examined on the merits are 4-9, 12-17, 19 and 21-28, which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4-9, 12-17, 19 and 21-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support is not found in the specification for the invention as now claimed. The page and lines should be pointed out where the specification discloses a method of the scope of claim 22 when using derivatized polyethylene glycol cross-linked with collagen as a sealant.

A method containing a combination of steps as required by claim 23 is not readily apparent in the specification. The page and lines should be pointed out where each of the steps a)-e) of claim 23 are disclosed in combination as claimed. Support is not readily apparent for the conditions of claim 4 as amended, claim 19 as amended and for the conditions of new claims 26-28 in a method as required by claim 23. The page and lines should be pointed out where each of the limitations of these claims is disclosed as claimed.

Claim Rejections - 35 USC § 112

Claims 4-9, 12-17, 19 and 21-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is improperly dependent on claim 23 by including cells that differentiate into chondrocytes since claim 23 is limited to only chondrocytes. Furthermore, the chondrocytes required in claim 6 appear to be already required in claim 23.

In claim 22 and where recited in other claims, the terms "superficial cartilage layer", "neo-cartilage construct" and "neo-cartilage implant" are uncertain as to meaning and scope. Being "neo" and "superficial" is relative and subjective. Additionally, there is not clear antecedent basis for "said neo-cartilage implant" in line 4 of claim 22.

In line 6 of claim 22, "derivatized polyethylene glycol" is uncertain as to the modification of polyethylene glycol that is a

derivative. Modified of polyethylene glycols that are derivatives are not found in the specification.

Claim 22 is unclear as to where in the method the superficial cartilage layer is formed since the steps carried out do not require a final step that produces the layer.

In step b) of claim 23, the difference in a sol and sol-gel is uncertain. If the sol-gel is a gelled sol, this should be made clear.

In line 7 of step d) of claim 23, the meaning and scope of "medium flow rate" is uncertain. Being medium is relative and subjective. Additionally, in this line, it is uncertain how "temperature" and "time" are conditions promoting activation. Time and temperature exist in any environment.

Claim 23 is unclear where in claim 22 the steps of claim 23 are carried out. The steps of claim 23 constitute a complete method without depending on claim 22, and the claim should be in independent form. Furthermore, when depending on claim 22, the sealant cannot be polyethylene glycol cross-linked with methylated collagen in claim 23 since the sealant in claim 22 is limited to a derivatized polyethylene glycol cross-linked with collagen.

Response to Arguments

The response urges that terms used in claim 22 are explained in the specification. However, the claims and not the specification define metes and bounds of the invention, and terms used in the claims must be definite without relying on the specification. Being "neo" and "superficial" is relative and subjective. It would be uncertain

when cartilage is neo and not neo, and a cartilage layer is superficial and not superficial.

Claim Rejections - 35 USC § 103

Claims 4-6, 12-17, 19, 21-23 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (6,528,052 B1) in view of Wise et al (American Surgeon) and Rhee et al (5,475,052), and if necessary in further view of Rhee et al (5,565,519) (Wise et al and Rhee et al references newly applied).

The claims are drawn to a method for treatment of an articulate cartilage lesion and for formation of a superficial cartilage layer by surgically implanting a neo-cartilage construct into the lesion, and covering the construct with a layer of a top adhesive sealant that is derivatized polyethylene glycol (PEG) cross-linked with collagen. In claim 23 the method is carrier out by isolating chondrocytes from cartilage, expanding and suspending the chondrocytes, seeding the chondrocyte suspension into a support matrix, preparing a neo-cartilage construct by subjecting the seeded support to conditions that promote activation and propagation of the chondrocytes, implanting the construct in a cartilage lesion, and depositing over the construct a top adhesive sealant that is PEG cross-linked with methylated collagen.

Smith et al disclose formation of cartilage tissue *in vitro* from chondrocytes and implanting the cartilage (col 9, lines 22-33). The cartilage is formed by isolating cartilage cells, and culturing the

cells while in a scaffold or support (col 9, line 30). The resultant cartilage tissue is transferred to a defect (col 9, lines 35-40).

Wise et al disclose using a collagen-polyethylene glycol sealant to seal leaks after liver transplantation.

Rhee et al ('052) disclose using a collagen-polyethylene glycol matrix (cols 15-17 and col 20, line 60 to col 23, line 67) for implant applications.

Rhee et al ('519) disclose using a collagen-polyethylene glycol conjugate for ophthalmic applications (cols 9-20)

It would have been obvious to seal a defect after implanting cartilage tissue in a defect as disclosed by Smith et al using a collagen-polyethylene glycol sealant as suggested by Wise et al using this sealant and Rhee et al using a collagen-polyethylene glycol matrix for implant applications. It would have been obvious that sealing the defect after implanting will be advantageous to prevent contamination and infection at the site of the defect. The cartilage produced by Smith et al before implanting is inherently a construct. If needed Rhee et al ('519) would have further suggested using a collagen-polyethylene glycol sealant from disclosing using a collagen-polyethylene glycol conjugate for ophthalmic applications. A hydrostatic pressure as in claim 12 is disclosed by Smith et al. Methylated collagen as in claim 23 is taught by Rhee et al ('052) (col 16, line 29). The parent application does not antedate Wise et al since the presently claimed invention is not disclosed in the parent application.

Response to Arguments

The response urges that Smith et al do not disclose a need for sealant. However, after implanting, a sealant would have been obvious to close the wound resulting from surgical implantation against the outside environment for the same reason that a bandage is placed on wound. Formation of a superficial cartilage layer will be inherent as the defect heals. Smith et al is not applied alone, but in combination with Wise et al and Rhee et al ('052), and if needed Rhee et al ('519), and these references would have suggested a collagen-polyethylene glycol sealant. As to the argument concerning the use of a bottom layer of sealant, this layer is not required by the present claims.

Double Patenting

Claims 4-9, 12-17, 19 and 21-28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2-5, 7-9 and 21-29 of copending Application No. 10/625,822. Although the conflicting claims are not identical, they are not patentably distinct from each other because the present claims of treatment of articulate cartilage using a top sealant, or top and bottom sealants, would have been obvious from the claimed method of the copending application for repairing articular cartilage using top and bottom sealants.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Double Patenting

Claims 4-6, 12-17, 19, 21-23 and 26-28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21-42 of copending Application No. 10/625,245 in view of Wise et al and Rhee et al (5,475,052), and if necessary in further view of Rhee et al (5,565,519).

For the type of reasons set forth above in the 103 rejection, it would have been obvious to seal a defect after implanting the construct of the copending application claims using a sealant suggested by Wise et al and Rhee et al ('052), and if needed Rhee et al ('519).

This is a provisional obviousness-type double patenting rejection.

Double Patenting

Claims 4-6, 12-17, 19, 21-23 and 26-28 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,949,252 B2 in view of Wise et al and Rhee et al (5,475,052), and if necessary in further view of Rhee et al (5,565,519).

For the type of reasons set forth above in the 103 rejection, it would have been obvious to seal a defect after implanting the construct of the patent claims using a sealant suggested by Wise et al and Rhee et al ('052), and if needed Rhee et al ('519). Formation of a superficial cartilage layer will be inherent when the defect containing the sealed implanted construct heals.

Response to Arguments

The type of comments set forth above in response to arguments concerning the 103 rejection also apply to this rejection.

Double Patenting

Claims 4-6, 12-17, 19, 21-23 and 26-28 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,528,052 B1 in view of Wise et al and Rhee et al (5,475,052), and if necessary in further view of Rhee et al (5,565,519).

For the type of reasons set forth above, it would have been obvious to seal a defect after implanting the in vitro formed cartilage of claim 16 of the patent using a sealant suggested by Wise et al and Rhee et al ('052), and if needed Rhee et al ('519). Formation of a superficial cartilage layer will be inherent when the defect containing the sealed implanted construct heals.

Conclusion

Claims 7-9, 24 and 25 are free of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David M. Naff
Primary Examiner
Art Unit 1651

DMN
9/28/06